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RANGE IMPROVEMENT



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FOREST SERVICE — U. S. DEPARTMENT OF AGRICULTURE
INTERMOUNTAIN REGION — OGDEN, UTAH

STATEMENT OF PURPOSE

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This publication is printed primarily to inform professional range administrators of important range improvement and management developments and findings. These "NOTES" may include extracts of published papers, unpublished preliminary reports of research work, unpublished reports on administrative studies and personal observations or suggestions of other range administrators. No claim is made as to the accuracy or completeness of studies or conclusions drawn.

All who read these RANGE IMPROVEMENT NOTES are encouraged to submit material for publication, or suggestions for improving its usefulness. Full credit will be given for any material used.

RANGE IMPROVEMENT WITH WEED CONTROL

taken from

RANGE AND WILDLIFE ABSTRACTS - Rocky Mountain Region - 10/31/63

The following taken from "The Weeds," a Colorado Extension Service pamphlet by Eugene Heikes, Extension Weed Specialist, is worthy of some deep thinking.

There should never be anything called range weed control projects, but rather range improvement projects which include weed control. Approach the situation as a total management package on a plan-wise basis. Control of range weeds is a complex situation because of the many species of forbs involved. Some of these forbs may be needed for livestock forage, soil stabilization, water protection, or wildlife habitat. Often the elimination of weeds from rangeland is not economical or a sound venture.

Range weed problems are almost always caused by mismanagement. A vigorous stand of perennial grasses and forbs is unlikely to become invaded by weeds. Hence, rangeland weed control must be tied in with other range improvement practices and included in a total management package.

Sagebrush Control Pays

Research has fairly well proven that sagebrush control (with proper live-stock management) is good business. Forage yields have been increased from 100% to 400%. Usually a significant number of sagebrush plants survive on treated areas, even where control is considered excellent. Also, fringe areas and small patches are usually not treated and some reinvasion can be expected. Hence, the general impact on wildlife is not too significant.

Biological Control of Weeds

Research is increasing its efforts on biological control of many noxious weeds. Studies on insect-weed relationships are being carried out on Canada thistle, dalmation toadflax, whitetop, puncture vine, halogeton, Russian thistle, and other species. There are now three laboratories, located in Albany, California; Rome, Italy; and Buenos Aires, Argentina devoted to such studies. Favorable results, as was the case in control of St. Johnswort, can be expected in due time.

Note: Underscoring and () supplied by abstractor.

HERBICIDE TRIALS FOR CONTROL OF PERENNIAL WEEDS

RANGE AND WILDLIFE ABSTRACTS - Rocky Mountain Region - 8/28/67

Field testing of herbicides for the control of noxious weeds has been conducted at selected locations in Colorado over the past five years. Plots have been established to determine the effectiveness of herbicides for control of Canada thistle, field bindweed, Russian knapweed, leafy spurge, woollyleaf povertyweed, common toadflax, larkspur species, pricklypear cactus, and several brush species.

Plots were established with the help of county extension agents, weed district supervisors, industry representatives, forest supervisors, and farmers. We know that herbicides frequently do not respond the same under different conditions. For this reason, treatments were replicated at several locations in the State to observe differences in climate, soil, altitude, etc. All plots were established with a power sprayer in heavy stands of uniform infestations. Most of the more promising, new, and older herbicides have been tested in this manner over the past seasons. Chemical control recommendations for local areas and for the State are based on results obtained.

CANADA THISTLE (Cirsium arvense)

Canada thistle (Cirsium arvense) is one of Colorado's most serious noxious weeds. According to survey data in 1963, 39 counties reported more than 250,000 acres infested with this weed. Several herbicides have proven effective for eradication of Canada thistle. Tordon applied at the rate of 1-1/2 pounds per acre and above has consistently killed 100% of Canada thistle stands - in some areas 1 pound per acre has completely eradicated this weed. Banvel-D at 4 and 5 pounds per acre applied in the fall after harvest has killed 60-70% without tillage. When combined with tillage or 2,4-D the following season, a higher percentage eradication can be expected, but Banvel-D will usually not eradicate Canada thistle with one application. Therefore, the season after application, we recommend that it be combined with tillage and/or 2,4-D in crops such as small grains, and a repeat application of Banvel-D be made the second fall on remaining plants.

One application of 2,4-D (any formulation) usually has little effect on Canada thistle. Many formulations have been tested at equal rates and there appears to be little difference on final results. However, two applications of 2,4-D Amine per season (spring and fall) for three consecutive seasons has completely eradicated Canada thistle with no new plants showing up for two seasons after the last treatment.

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FIELD BINDWEED (Convolvulus arvensis)

Field bindweed (Convolvulus arvensis) is also one of Colorado's most serious perennial weeds. In some areas it has taken over entire fields of valuable cropland. It is especially troublesome in the dryland wheat growing areas. In competition with winter wheat, field bindweed will reduce crop yields 75% or more. Although bindweed can be held down with 2,4-D, it will usually not be eradicated.

Several herbicides tested will kill 90% or more of an established stand of field bindweed; but because of dormant seeds and new seedlings, treated fields must be policed and seedlings controlled for years after using any herbicide. Otherwise the area will become reinfested in a short time. However, first-year seedlings can be killed with 2,4-D or tillage practices.

Tordon liquid at one-half to one pound per acre or Tordon granules at one to two pounds per acre will usually result in 100% control.

RUSSIAN KNAPWEED (Centaurea repens)

Russian knapweed (Centaurea repens) is one of the more serious perennial weeds and most difficult to control.

Tordon applied at the rate of one pound per acre has looked promising for eradication of Russian knapweed. Two pounds per acre has consistently killed 100% of established stands. The application of 2,4-D (any formulation) has little permanent affect on Russian knapweed. Rates up to six pounds per acre have been tested and were no better than two and three pounds.

LEAFY SPURGE (Euphorbia esula)

Leafy spurge (Euphorbia esula) does not infest as many acres in Colorado as states to the north of us, but is one of the most difficult weeds to control or eradicate once it becomes firmly established in an area. It spreads both by seed and an extensive creeping root system. It will invade good farmland or the poorest waste land. Leafy spurge seems to prefer sandy soils, but will also grow in heavy soils. It begins growth early in the spring and blooms throughout the summer. This early, rapid, rank growth gives the weed a great competitive advantage over spring seeded and a low growing crop. An average infestation produces between 200 and 400 pounds

of seed per acre. The seed capsule is capable of throwing the seeds 15 feet or more when mature. Every effort should be made to control and eradicate this weed before it infests the many acres in Colorado that field bindweed and Canada thistle do.

Tordon liquid at two pounds per acre or Tordon granules at 1-1/2 to two pounds per acre gave good control, but followup is necessary.

OTHER NOXIOUS WEEDS

Herbicides have been tested for their effectiveness on several of the other noxious weeds important in Colorado. These include common toadflax (Linaria vulgaris) and the povertyweed species (Franseria species).

Common toadflax is a serious noxious weed in northwestern Colorado (Routt, Moffat and Rio Blanco Counties). An extensive series of plots were established in Rio Blanco County, June 30, 1965. After two years, Tordon applied at a rate of two pounds per acre (liquid and granuals) has controlled 95% of the original stand, and three pounds per acre 99%. Banvel-D at five and 10 pounds per acre has controlled 40% and 50% respectively. Applications of 2,4-D have not been effective. In applications of 2,4,5-TP (silvex) at the rate of two and four pounds per acre, one application has controlled 20% and 50% respectively. However, repeated applications of 2,4,5-TP have given fairly good results.

Herbicides were applied to a heavy stand of woollyleaf povertyweed in Prowers County, July 13, 1966. Tordon at 1/2 pound per acre controlled 70% of the original stand, one pound per acre 95%, one and one-half pounds per acre 99% and two pounds per acre 99%. The combinations of Tordon and 2,4-D were not as effective as the straight Tordon comparing similar rates of Tordon.

SUMMARY

Tordon continues to give consistent control of most deep-rooted perennial weeds at rates of one pound and above. It has been more effective in the dryland areas and on lighter soils than on the heavier soils. Combinations of Tordon and 2,4-D have not looked any better than the same rates of Tordon by itself - in some areas - less.

PROPER USE OF TORDON

From

RANGE AND WILDLIFE ABSTRACTS - Rocky Mountain Region - 10/31/66

Weed control is a new but rapidly developing science. Increasing knowledge of how chemicals affect plants, how they react in different soils, coupled with the development of new chemicals may lead to a virtually weed-free environment.

Many problems are involved before attaining such a utopia. One such problem is the proper use of Tordon (Picloram). While probably the most effective and dependable herbicide ever developed for perennial weed control, it is not a cure-all. Tordon is at least twenty times more potent than 2, 4-D. Its toxicity to man, animals and fish life is very low, yet it is registered in most states for use under limited conditions only. The 7/25/66 registration states in part, ". . . Do not plant treated land to grass crops to be used for food or feed within two years after application Do not graze treated areas. Do not contaminate water used for domestic purposes."

Many crops, as well as most deep-rooted perennial weeds, are sensitive to Tordon. This chemical can be moved from treated areas by soil leveling, water or silt flow, dust storms, road grading, etc. In one case only one-half pint of Tordon was used to spot treat a 40-acre field of potatoes, but herbicide injury was detected over most of the whole field. In another case of spot treatment, very little lateral movement of the chemical was noted in 1965, but damage was evident over most of the field in 1966. Extreme caution in use of this or any other herbicide is indicated, lest misuse result in further restrictions, or even removal of the chemical from the market.

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THE THREE really GREAT things in the world are
a mountain, the ocean, and an earnest man at his work.
The potentials of each are beyond human calculation.

RUSSIAN RYE TOPS - ONCE IT TAKES HOLD

By

Karl G. Parker, Extension Range Specialist
Utah State University

Any grass which combines extreme drought resistance with high beef gains and a long season of palatability must be tops!

And these are not the only good characteristics of perennial Russian wildrye. It is also an early starter. In defiance of the backward spring this year, 1967, Russian wildrye was more than five inches high and ready to be grazed by March 18 in the Snowville area of northern Utah.

On semi-desert range experiments, this grass showed that it will stand more alkali than other common grasses used in seeding permanent pastures in the 10 to 15-inch rainfall belt.

Russian wildrye, an Asian grass, was introduced into the United States prior to 1920. After a few trial plots, it was discarded because it was said to be low in yield. The early trials didn't discover its excellent grazing values; only its forage yield was measured.

Recent experiments in Utah, Montana, other states and Canada rate it much higher for permanent pasture seeding. It is seen as a good supplement for crested wheatgrass, but not its replacement. Actually, livestock gains on Russian wildrye during the spring were comparable to intermediate and tall wheatgrasses and were considerably better than pubescent wheatgrass and crested wheatgrass in recent Utah experiments. Its percentage of protein was highest in Montana range grass trials.

Nutritional quality of Russian wildrye is excellent throughout the growing season, except that it might be slightly lacking in phosphorus on certain soil types. Palatability for cattle and sheep is higher throughout the season than for most cool-season grasses. It retains its nutritional values comparatively well, even for winter grazing.

Russian wildrye can be grazed in the late spring, after crested wheatgrass has become unpalatable. It fits very nicely into the following season-long grazing rotation:

1. Crested wheatgrass for early spring grazing
2. Russian wildrye in the late spring

3. Native range for the summer

4. Another field of ungrazed Russian wildrye in the fall.

This means that Russian wildrye is a good pasture grass for rangelands in Utah, Nevada and other northern states where soils are fairly fertile but moisture is short. In northern Utah alone, 200,000 acres of Russian wildrye could be seeded.

Russian wildrye seed is not expensive. It is usually priced lower than crested wheatgrass seed, due to a lack of information about it, particularly on how to get good stands.

Drill spacings can be 10 to 18 inches. Wider spacings are necessary if you expect to try to produce seed. County extension agents should be consulted regarding seed production row spacings. (Consult local SCS men, too - Editor.)

Russian wildrye can stand close grazing, but it will produce more and come out green earlier in the spring if it is grazed moderately - not more than 60 percent of the season's growth. In a rotation grazing plan, you can get more usage if you rest the pasture while there is still moisture and warm season for regrowth before freezeup.

Experiments in nearly all the western states show that Russian wildrye is our longest-lived introduced pasture grass in the 8 to 15-inch rainfall belts. It compares favorably with our most drought resistant native plants for life of the stand.

Properly grazed, it will maintain itself as a strong bunchgrass with an abundance of basal leaves and a few long slender seed stocks. However, in one demonstration plot in Montana where it was grazed heavily for 35 years, it became stunted. The answer to this problem is not plowing it up and reseeding it, but rather in fertilizing with 30 to 50 pounds of nitrogen per acre - in the spring - followed with one or two years of nongrazing. Phosphorus fertilization might be advisable at 20 to 30 pounds per acre where the soil is low in phosphorus.

EFFECTS OF SAGEBRUSH MANIPULATION ON SAGE GROUSE

By

Neil Martin - Montana State Fish, Game and Parks
Commission

ABSTRACT

A study was conducted during the summers of 1962, 1963, and 1964, on a 1,900-acre allotment in southwestern Montana. A total of 1,710 acres of the allotment has been sprayed in 1961 with 2,4-D to control sagebrush. A total of 190 acres of the allotment, consisting of three strips approximately one and one-quarter miles in length and five chains in width, as well as areas along streams, were left unsprayed. Objectives of my study were to obtain quantitative data on effects of chemical control of sagebrush on a sage grouse population. Canopy coverage measurements of vegetation on the 1,900-acre allotment revealed about 80 percent grasses and 20 percent forbs in sprayed strips and 60 percent grasses and 40 percent forbs in unsprayed strips. Low shrub canopy coverage in sprayed strips was reduced as compared with unsprayed strips, and 97 percent of the big sage plants evaluated were recorded as dead. Only 8 percent were recorded as dead in unsprayed strips. Sprayed strips provided only 4 percent of the 415 sage grouse observations made on the 1,900-acre allotment. Ninety-one percent of the 15 sage grouse observed in sprayed strips were within 95 feet of an unsprayed strip.

Canopy coverage measurements of herbaceous vegetation at 137 sage grouse locations, most of which were outside the 1,900-acre allotment, consisted of approximately 60 percent grasses and 40 percent forbs.

Low shrub canopy coverage was similar from year to year, and 92 percent of the big sage plants evaluated were recorded as living. The similarity of the vegetation composition at sage grouse locations and in the unsprayed strips led to the conclusion that the differences in numbers of sage grouse observed in sprayed and unsprayed strips were related to vegetation composition. Density, percent crown coverage, and maximum height of big sage plants were determined at each of 159 sage grouse locations. Broods, six weeks or less of age, were found on areas having a lesser density and lower percent crown coverage of big sage than were older broods and adults. Food habits were determined by analysis of the contents of 35 sage grouse crops. Sagebrush and three genera of forbs together constituted 94.6 percent of the total volume. Dandelion and sagebrush had the greatest total percent frequency of occurrence of all food items. These high frequency food plants were more abundant in unsprayed than in sprayed strips, which strengthened the conclusion that differences in numbers of sage grouse observed in unsprayed and sprayed strips were related to vegetation composition.

OCHOCO N.F. OBSERVATIONS

Taken from
N.W. FOREST SERVICE NEWS - August 15, 1967

For many years the value of Western False Hellebore as a forage plant has been questioned. Because of its tendency to crowd out more palatable vegetation, we agreed to rid our mountain meadows of it by spraying. Now the Ochoco has paused to reflect. We no longer doubt the value of False Hellebore - not as a forage plant - but as a forest product having commercial value. Our first sale of 250 tons (green weight) of False Hellebore root bulbs has just been made and is now being harvested. The bulbs will be processed for use in the manufacture of insecticides. Purchase price was \$1.60 per ton, with an estimated harvest of five tons per acre. In addition, the purchaser is responsible for reseeding the disturbed area (approximately 50 acres) to grass and has elected to make cooperative deposits to cover the cost of the work. Who knows? The poison from our False Hellebore may be in the insecticides use in your next spray project.

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When we cannot find contentment in ourselves
it is useless to seek it elsewhere.

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It's not WHERE but HOW SAFELY you work
that's important.



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